
Texas Department of Public Safety
Report on Interoperable Communications
to the Texas Legislature
August 2012
DEPARTMENT OF PUBLIC SAFETY
TEXAS
COURTESY · SERVICE · PROTECTION
THE STATE OF TEXAS
TEXAS DEPARTMENT OF PUBLIC SAFETY
AMBULANCE
STATE TROOPER

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1 Defining the Problem

For decades, inadequate and unreliable communications have compromised the ability of emergency responders[1] across Texas and the Nation to perform their mission-critical duties. When responders do not have basic "operability" to communicate with others in their own agency, or "interoperability" to communicate with other disciplines or neighboring jurisdictions, the lives of Texas citizens and emergency responders are at risk.

- **Communications operability** is the ability of emergency responders to establish and sustain communications in support of mission operations.[2] Mission operations include responding to, and recovering from, traffic incidents, house fires, medical emergencies, and major critical incidents such as hurricanes, tornadoes, and wildland fires. According to the U.S. Department of Homeland Security's (DHS) National Emergency Communications Plan (NECP)[3], *"communications operability is a critical building block for interoperability; emergency response officials first must be able to establish communications within their own agency before they can interoperate with neighboring jurisdictions and other agencies."* Due primarily to economic hardship, a number of emergency responders in Texas do not have public safety two-way radios to communicate with dispatchers or others within their agency.

- **Communications interoperability** is the ability of emergency responders to communicate among jurisdictions, disciplines, and levels of government using a variety of frequency bands, as needed and as authorized. There must first be *operability* before there can be *interoperability*.[4] Communications interoperability among law enforcement, fire, and emergency medical service (EMS) responders is critical to helping protect the lives of Texas citizens and emergency responders themselves as they prepare for and respond to major natural disasters and also planned occurrences, such as sporting events, large community gatherings, and music festivals.

There are a variety of challenges to achieving operability and interoperability; some are technical, some financial, and some stem from human factors, such as inadequate planning and a failure to understand the importance and impact of interoperability. Key emergency response communication problems in Texas that prevent or hamper basic operability and interoperability include, but are not limited to, the following issues:

- Inadequate and drastically reduced funding to sustain and improve communications systems
- A lack of radio communication equipment e.g., some agencies do not have radios

[1] The term 'emergency responders' refers to persons from the broad public safety and first responder community including but not limited to: law enforcement, fire, emergency medical services, emergency management, transportation, public works, and hospitals.
[2] Definition taken directly from the U.S. Department of Homeland Security's National Emergency Communications Plan
[3] NECP: http://www.dhs.gov/xlibrary/assets/national_emergency_communications_plan.pdf
[4] According to the U.S. Department of Homeland Security's National Emergency Communications Plan

- Limited radio signal coverage for some agencies (particularly in more rural regions), meaning radios are unreliable
- Obsolete and ineffective radio systems, radio towers, and antenna systems
- Disparate frequency bands: Radios in one frequency band cannot directly communicate with radios in other bands. For example, VHF radios cannot directly communicate with UHF or 700/800 MHz radios.
- Limited and fragmented funding
- Proprietary radio systems that do not meet the current Project 25 (P25) suite of standards
- Varying procurement processes
- A lack of effective governance structures
- Standard operating procedures that are documented but may not be practiced
- A lack of standardized, basic communications training for all radio-carrying responders
- Some agencies across the State currently do not have the equipment necessary to meet the Federal Communications Commission (FCC) mandate for Narrowbanding. Failure to meet this requirement by the end of 2012 (when existing wide-band operational authority ends) will result in zero voice communication capabilities for non-narrowbanded agencies.

When responders are unable to communicate within their own agency or across jurisdictions, disciplines, or levels of government, minutes are wasted, and the result can be loss of life and/or property. The scenarios below outline actual incidents that have occurred in Texas and highlight the substantial problems that can result from a lack of operable and interoperable communications.

Wildland Fires

Texas is very familiar with the dramatic, drought-causing wildland fires that occur each year, but none have marked such a place in history as the 2011 fire season, the worst in recorded Texas history. Between November 15, 2010 and October 31, 2011, 30,457 fires ignited, burning 3,993,716 acres and 3,017 homes. Two firefighters lost their lives. Through coordinated fire response efforts, 39,413 homes were saved from the blazes.

Figure 1 – Smoke covering the sky from massive Bastrop Complex Fire

Additionally, over the last five years, there have been 48,150 wildfires, burning 4.1 million acres in Texas, killing 23 people, causing numerous injuries, and consuming 1,222 homes. Resources from across Texas and the Nation are called upon to support these vast firefighting efforts every year. While these additional resources are extremely helpful, problems occur when personnel from various local, State, and Federal agencies are unable to communicate with one another.

This made coordinating the unified command, operations, logistics, and air-to-ground communications extremely challenging. In some cases, communications simply did not exist. In addition, volunteer fire departments respond to 90 percent of the wildfires in the State, and they are often not eligible for the grant funding that most county and local fire departments receive for communications. Not only are these volunteer departments not able to communicate with other agencies, they often do not have the capability to communicate with their own firefighters.

Hurricanes

Figure 2 – Flooding in Cedar Park, TX following Tropical Storm Hermine September 2010

Since Hurricanes Katrina and Rita in 2005 and Hurricane Ike in 2008, more emphasis has been placed on coordinating emergency response to hurricanes in Texas. During Ike, major evacuations occurred along the Texas coast, including hospitals and other care facilities. Ambulance crews brought in from across the State and Nation to assist with this effort found that interoperable radio communications were either limited or completely non-existent. Law enforcement, fire, and EMS responders could not communicate, in some cases within their respective disciplines or with other agencies, primarily because there were no interoperable solutions available. To achieve interoperability, emergency responders must either acquire radio capability in three separate frequency bands: VHF, UHF, and 700/800 MHz, or integrate gateway ("patching") devices that can be limited in capability and not provide effective range. This inability to communicate resulted in greater expense, loss of operational efficiency, and wasted time switching between the radios and channels.

Border Communications

The 1,240-mile Texas-Mexico border presents numerous homeland security concerns, many of which center on the lack of basic radio operability in parts of the region, as well as poor interoperable communications among local, tribal, State, and Federal law enforcement agencies. In addition, daily incidents occur along the border when law enforcement officers, fire departments, EMS, and other emergency responders are unable to communicate with their counterparts in Mexico. An effort is underway involving the U.S. Department of State, the DHS Office of Emergency Communications (OEC), and the Mexican government to pursue a cross-border communication capability between U.S. and Mexico public safety agencies, but full realization of cross-border interoperable communications is still years away.

2 Interoperable Communications in Texas – the Vision

Vision Statement from Texas Statewide Communication Interoperability Plan

By the end of 2015, provide all public safety and critical infrastructure responders at all levels of government, including local, county, special districts, tribal, State, and Federal, with the highest level of real-time direct interoperable voice radio communications and Long Term Evolution (LTE) broadband data and video communications utilizing standards-based systems.

To achieve this vision and enable responders to better protect the lives and property of Texans, the Texas Department of Public Safety (TxDPS) and the Texas Interoperable Communications Coalition (TxICC), are working with the 24 Texas Councils of Governments (COGs), and with State agencies that use public safety radios. The desired end result is to implement 24 Regional Interoperable Communications Plans (RICPs) in alignment with an overall State strategy to improve communications interoperability. The 24 regions each created a RICP driven by needs in their region, and aligned the plans with the existing statewide "system of systems" strategy. Once implemented, the RICPs will enable emergency responders across the State to better communicate with one another when needed.

Texas Interoperable Communications Strategy

Create partnerships among emergency response agencies throughout Texas to build and maintain a cost-effective interoperable communications network using shared resources.

RICPs are currently focused on radio voice communications. However, TxDPS and the TxICC will work with regions to ensure public safety Long Term Evolution (LTE) broadband planning is also incorporated in the future to reflect the direction of LTE in the State.

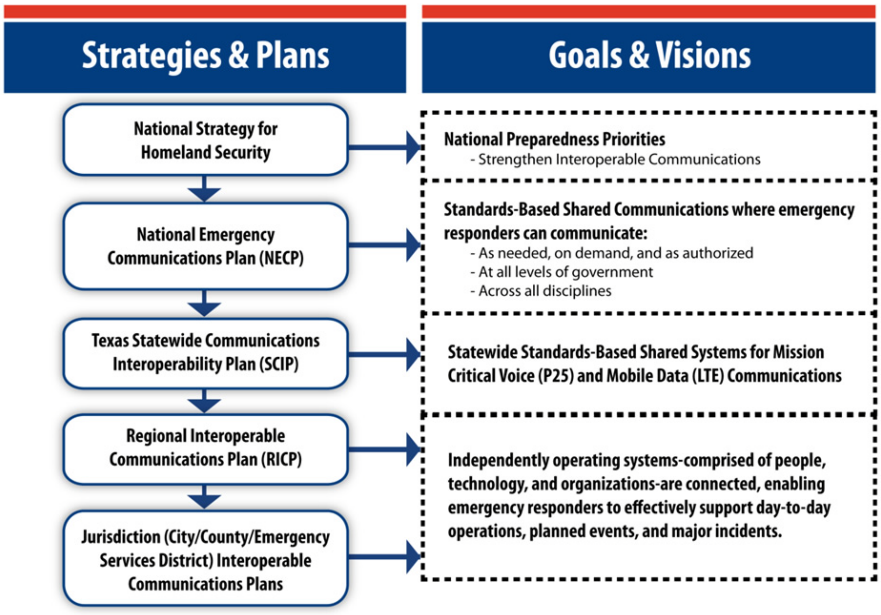


Figure 3 – Texas Alignment with National Strategy

As indicated in Figure 3, TxDPS and the TxICC are working with Texas responders to ensure the local, regional, and State communication strategies are in alignment with the NECP and National Strategy for Homeland Security.

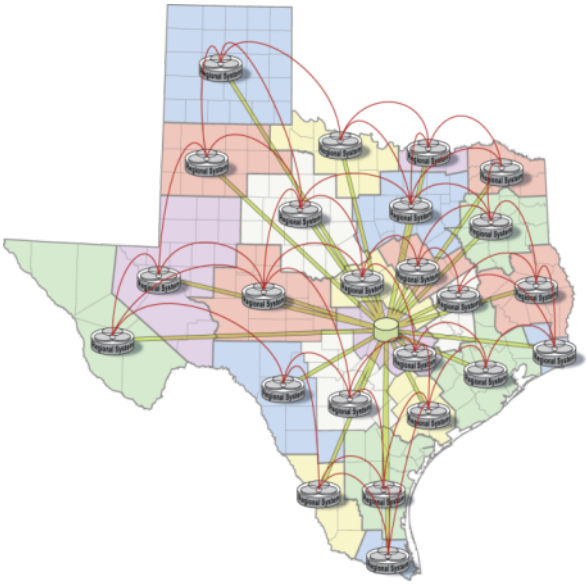


Figure 4 – Texas "system of systems"

Defined by the DHS SAFECOM program, a "system of systems" exists when a group of independently operating systems – comprised of people, technology, and organizations – are connected, enabling emergency responders to effectively support day-to-day operations, planned events, or major disasters. The Texas "system of systems" will enable agencies and regions to meet their specific needs while connecting to a broader network of resources. Figure 4 provides a conceptual illustration of how regional systems will operate independently, but will also have the ability to communicate with other regions and agencies, as needed, through the use of "gateways" and other interoperable solutions.

Governance

The TxICC, which represents Texas's 5,300 public safety and emergency response agencies, was formed in 2006 to work toward improving the disjointed approaches to emergency response communications across Texas. Prior to the TxICC, there was no statewide user group specifically constituted to examine radio communication problems across Texas and identify cohesive solutions to address them. While the TxICC made great strides in developing the Texas Statewide Communications Interoperability Plan (SCIP)[5], and forming partnerships between agencies that previously had little or no working relationships, the State was still lacking a single oversight body at the State-agency level. In May 2010, TxDPS assumed responsibility as the oversight State agency to:

- Implement the State public safety wireless communication strategy
- Coordinate with the 24 COGs to develop and implement their regional wireless communication strategies in support of the statewide goal
- Ensure that grant funds are distributed and spent effectively in alignment with that strategy [in collaboration with the TxDPS State Administrative Agency (TxDPS-SAA)], which is under the TxDPS Chief of Staff's Office in the Homeland Security Division

[5] The Texas SCIP can be found at:
http://www.txdps.state.tx.us/LawEnforcementSupport/communications/interop/documents/texasSCIP.pdf

Governance

The principles by which TxDPS is working with the COGs to create this system of systems include:

- **Operability for All** – While interoperability across the State is the public safety wireless communication goal for Texas, many areas still need assistance to achieve a basic ability to communicate within their own agency (operability) before they can communicate with other agencies (interoperability). As these agencies purchase wireless communication equipment to become operable, they are encouraged to ensure that the equipment purchased will ensure interoperability with relevant disciplines and jurisdictions.

- **Standards-based Systems** – The nationally recognized P25[6] suite of standards has been adopted by the emergency response community and the Federal Government. Most Federal grant programs require that wireless communication systems purchased with grant funds are P25 compliant. Likewise, the TxDPS-¬State Administrative Agency (SAA) also requires that radio equipment purchased with grant funds that flow through the SAA to be P25 compliant.[7] The Texas SCIP sets forth the vision that all emergency response wireless communication systems in Texas be P25 compliant by the end of 2015.

- **Driven by End-user Needs** – The regional systems and designs are driven by user-identified requirements. TxDPS is providing guidance and technical assistance to local and regional jurisdictions to assist them in achieving their regional communication goals. TxDPS is driven by the aforementioned vision statement to move Texas toward P25 standards-based shared systems, while remaining vendor neutral. The role of TxDPS is to ensure that these regional approaches and individual agency systems do not result in stove-piped communications.

- **Leverage Existing Resources** – Local, State, Federal, and private sector agencies continue to work with emergency response agencies across the State to leverage existing communication equipment, systems, and other resources to build the statewide system of systems. This approach saves time and money and can minimize recurring maintenance costs.

- **Coordinated Approach** – By coordinating with one another, agencies from different disciplines and jurisdictions at the local, tribal, regional, State, and Federal levels are able to leverage existing resources, coordinate purchases, and share infrastructure.

[6] http://www.project25.org/

[7] In special circumstances, the DPS-SAA permits "compelling reason exceptions" to the P25 requirement on a case-by-case basis, with the approval of the Texas Statewide Communications Interoperability Coordinator (SWIC).

3 Accomplishments

Improved/Integrated Public Safety Communications Training

In coordination with the DHS OEC and the Texas Department of Emergency Management (TDEM), the DPS Statewide Interoperability Coordinator's (SWIC) Office is developing a strategy and curriculum to integrate specific public safety communications training into existing public safety training efforts.

Currently, public safety responders in Texas do not have access to standardized public safety communications training for basic radio operations or for interoperable communications needed during incidents involving multiple jurisdictions, disciplines, and different radio systems.

This integrated training effort will have numerous benefits. It will leverage existing annual funding from the U.S. Department of Homeland Security's Emergency Management Performance Grant (EMPG), so local and regional agencies will not be required to spend additional funding for the integrated communications training. The purpose of the EMPG grant is to provide grants to states to assist state, local, tribal and territorial governments in preparing for all hazards. One of TDEM's objectives under EMPG is for each sub-grantee to "develop and maintain multi-year training and exercise plans" and they are also required to participate in an annual training and exercise plan workshop. It will be through this workshop that TDEM, OEC, and the SWIC office will work with local and state responders to identify their communications training needs and determine how to best integrate them into the existing training curriculums or to develop new ones.

National Emergency Communications Plan

The NECP, developed by DHS OEC, establishes a vision for emergency communications in the United States. To move the Nation toward this vision, the three core goals of the NECP establish target levels of interoperable emergency communications for local, tribal, regional, State, and Federal jurisdictions.
Texas has far exceeded the DHS expectation of 90% participation for Goal 1, and 75% participation for Goal 2.

National Emergency Communications Plan: Goal 1 and 2

NECP Goal 1

By 2010, 90% of all high-risk urban areas designated within the Urban Areas Security Initiative (UASI) are able to demonstrate response-level emergency communications within one hour for routine events involving multiple jurisdictions and agencies.

NECP Goal 1 Texas Report

- The 100% of the five UASIs in Texas successfully completed their event and submitted data to OEC in2010.

NECP Goal 2

By 2011, 75% of non-UASI jurisdictions are able to demonstrate response-level emergency communications within one hour for routine events involving multiple jurisdictions and agencies.

NECP Goal 2 Texas Report

- 99% of Texas' 254 counties completed their event and entered their data in the OEC online survey tool, as indicated in Figure 5.

As reported by OEC, few, if any, other states achieved the successes Texas accomplished by quantifying and verifying interoperable communications capabilities for Goal 2. To verify capabilities in a State with 254 counties – a State that is physically a straight line distance of 773 miles East to West, and 801 miles North to South[8] – even the regional approach required many events and exercises. COGs and the TxDPS SWIC Office reviewed and/or attended 48 separate events across the State. A total of 20 exercises and planned events were used by 14 COGs, and 29 past events and actual incidents including wildfires and hurricanes were used to verify capabilities in 11 COGs.

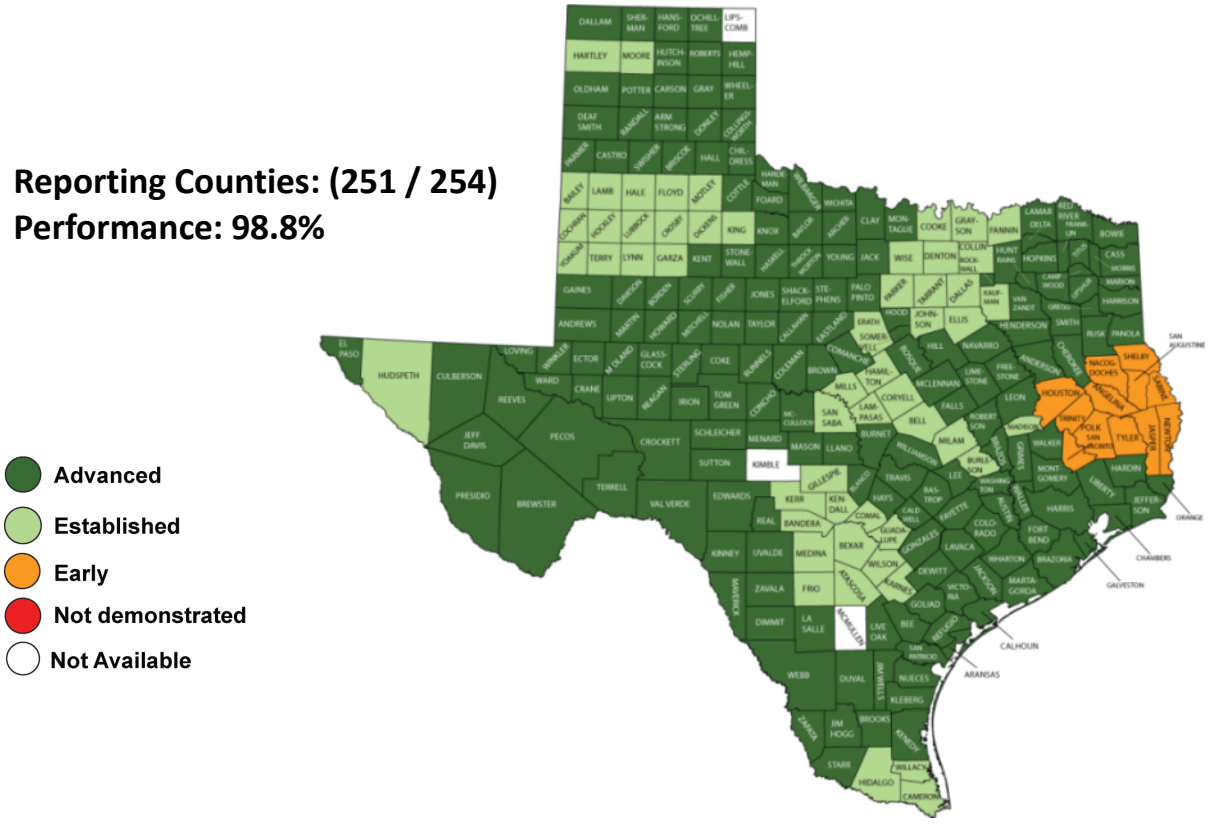


Figure 5 – Texas – NECP Goal 2 Performance Results

[8] According to the Texas Almanac - http://texasalmanac.com/topics/environment/environment

Texas 700 MHz Regional Planning Efforts

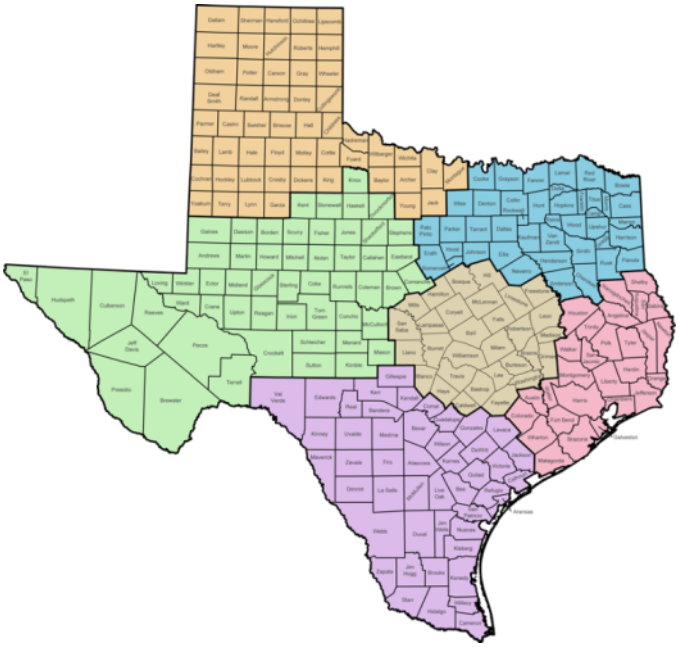


Figure 6 – Texas Regional Planning Committees

Title 47 Part 90.527 of the Federal Communications Commission Code of Regulations established a structure to allow Regional Planning Committees (RPCs) optimal flexibility to meet State and local needs, encourage innovative use of the radio spectrum, and accommodate new and unanticipated developments in technology and equipment. There are six Texas RPCs, and each committee is required to submit its plan for the 700 MHz Public Safety General Use spectrum.

In developing their regional plans, RPCs must ensure that their proposed plans comply with the rules and policies governing the 700 MHz public safety regional planning process. Due to the deadline of 12/31/2016 for 700 MHz radio operations at 6.25 KHz channel spacing, and the public safety broadband legislation announcing the flexibility of the 700 MHz narrowband channels, the FCC requested the State SWICs to assist Regions in the development of their 700 MHz Regional Plans. The FCC approval of these Plans will safeguard the 700 MHz narrowband channels for mission critical voice communications in the designated counties of the Region.

Three Texas RPC Regions have FCC-approved Plans; one Plan has been submitted to the FCC and is awaiting approval; and two Regions are working to submit their Plans by 2013.

Statewide Interoperability Communications Plan

The SWIC office has conducted an in-depth review and update of the Texas SCIP plan in coordination with the TxICC, which is comprised of representatives from each COG, UASI, and radio-using State agency. OEC conducted a SCIP Strategy Workshop in March 2012 to review and update initiatives with the TxICC which enabled participants to provide direct input into the plan and obtain their buy in. The SCIP was revised to be more succinct and readable for both outside parties and the TXICC.

4 Long-Term Evolution (LTE) Broadband

LTE 700 MHz broadband interoperable communication capabilities will enable public safety responders to receive and transmit greater amounts of data and video at a much faster speed from a mobile environment. At present, LTE does not provide mission-critical voice communications capability, so public safety agencies will continue to operate in the existing land mobile communications environment for a number of years to come.

700 MHz Public Safety LTE Broadband = High Volume of Information + Rapid Speed

Currently, public safety responders are only able to share and obtain small amounts of data and video at an unacceptably slow speed. With LTE broadband technologies, responders will be able to send and receive large amounts of data and video at higher speed. The difference in data volume between current capabilities and emerging LTE broadband wireless is analogous to water coming out of a small garden hose compared to water gushing out of large fire hydrant. A bigger pipe means more volume.

With LTE, responders will be able to more effectively:

- Transmit and view high-quality, full-motion streaming video for the purposes of:
  - Tactical operations (e.g., fire scenes, police operations, critical incidents, etc.)
  - Surveillances (e.g., crime-ridden hot spots, SWAT incidents, etc.)
- Download and view large-sized building plan files on the way to incidents, and even display building plans on the face shields of firefighter helmets – pictures and drawings which can change as the firefighters move about
- Wirelessly monitor geographic locations, heart rates, blood pressures, and breathing rates of responders during an incident (which is especially helpful during fire response)
- Read license plates and determine owners and "stolen" status by using a Smartphone or Tablet PC camera to take photos
- Collect and search fingerprint information
- Through facial recognition, obtain a person's identity by using a Smartphone or Tablet PC to take a photo, which can be used to search and match against existing databases
- Enhance situational awareness by providing real-time data and using interactive maps
- Transmit real-time patient vital signs and video from the scene of an incident to an incoming helicopter, back-up ambulance(s), and hospitals
- Provide a Situational Awareness capability not currently available to public safety responders

Public safety agencies are now using USB modems (also known as "air cards" or "dongles") operating on commercial carrier networks that are plugged into mobile computers (often mounted in vehicles), or in some instances make use of external modems mounted elsewhere in the vehicle. LTE modems will look much the same, but will primarily operate on the new nationwide Public Safety Broadband Network, and "roam" to commercial carriers when needed. Handheld LTE devices are still in manufacturer development, but should look similar to a large Smartphone (or maybe even a tablet style device) with a reasonable-sized display screen to enable viewing of videos, documents, and drawings. Handsets may have an LTE push-to-talk voice capability, but technology has not yet evolved to meet established "mission critical" public safety communications standards. For example, LTE devices will not work unless the network is present. There are no "direct channel" capabilities for unit-to-unit communication when out of network range, a critical requirement of current land mobile radios. Existing land mobile networks could be connected by gateways into the LTE network to enable mission critical land mobile public safety radios operating in different frequency bands to talk with LTE voice units.

What is Texas doing with LTE?

TxDPS has become a national leader in pursuing early deployment of public safety LTE broadband. The State of Texas has identified the following objectives for public safety LTE Broadband:

- To create an effective 700 MHz interoperable mobile public safety broadband network, which, when fully deployed, will enable public safety users operating in Texas to be safer, more responsive, and more effective when saving lives and property.
- To enable early deployments of 700 MHz interoperable mobile public safety broadband network layers in Texas.
- To facilitate an open, standards-based (3GPP) LTE environment which supports a healthy, competitive multi-vendor procurement environment for network infrastructure and terminal devices, while enabling LTE suppliers to innovate and produce sustainable products and services.
- To support the eventual deployment of a nationwide 700 MHz interoperable mobile public safety broadband network.
- To pursue public/private partnerships in order to leverage existing commercial capabilities and associated economies of scale. Among the more urgent areas for this partnership is the need to leverage commercial 3GPP Conformance and Interoperability Testing (IOT) programs.

To meet these objectives, noted below are some of the broadband-related accomplishments TxDPS has achieved over the past year.

FCC Broadband Waiver to the State of Texas

The Middle Class Tax Relief and Job Creation Act of 2012, commonly called the "D-Block" legislation, was passed on February 22, 2012. This bill provided an additional 10 MHz of spectrum allocated to Public Safety, providing a full 20 MHz bandwidth for the network.

The "D-Block" legislation also provides for the elimination of the waivers, which authorize individual jurisdictions to use the 700 MHz broadband spectrum, and the assignment of that spectrum to "FirstNet". FirstNet, which will become active August 22, 2012, is managed by a 15 member board selected by the Secretary of Commerce, and is entrusted with meeting Public Safety needs for broadband data. This new federal entity is responsible for identifying Public Safety broadband needs, designing the system, and building out the network in conjunction with the needs of each state, then operating and maintaining the network. The State of Texas is fully supporting the Harris County rollout of their "BIGNet" Public Safety LTE system. BIGNet will provide critical broadband communications in the nation's largest energy corridor and for the citizens of Harris County.

Harris County and Potential Other TxDPS Broadband Partners

The State of Texas is partnering with Harris County on construction of the first phase of the Texas portion of the single nationwide LTE public safety broadband network through use of a Federal port grant to Harris County, and funding from local sources. With the advent of FirstNet and the changes that have come with it, the State is moving from an "Application" focus to an Outreach and Education program. This program will provide basic and detailed information on FirstNet and the network to all jurisdictions in Texas, helping them to understand options, timeframes and other issues relevant to their organizations. The Texas Department of Public Safety will provide an interface to the FCC, NTIA, FirstNet and all jurisdictions in the State to support the effective flow of information between these entities and support the best decisions for all jurisdictions.

Texas Participation in National, Regional and Local LTE Working Groups

The State, through the Texas Department of Public Safety's Law Enforcement Support Division, Public Safety Communications Service, will continue to be an active participant in National, Regional and Local working groups, education programs, and other venues that move Public Safety LTE forward. The State has been active on Federal technical working groups, has been active in the FEMA Region VI Public Safety LTE Interoperability Forum, and is actively reaching out to jurisdictions through seminars, Council of Governments, and a newly created website, www.dps.texas.gov/LTE/index.htm.

Texas Goals and Next Steps

TxDPS will ensure any early public safety LTE deployments permitted by FirstNet in the State are developed to be consistent with the intended overall nationwide plan for interoperability. TxDPS will continue to serve as the State's single interface with the FCC, NTIA and FirstNet.

5 Funding Gap

Citizens look to their elected and appointed officials to ensure that public safety agencies can respond effectively in a crisis. An investment in infrastructure and communication equipment is necessary to achieve the aforementioned communications interoperability vision, and to enable basic communications operability in some areas of Texas. To provide effective public safety communication across Texas, ***$888-million in State funding, plus $449.5-million in Federal and local monies, will be required through 2015 build a statewide "system of systems" – a network of local and regional public safety communication systems connected together to provide "interoperability".***[9]

Total Interoperability Funding Need for Infrastructure Equipment – 2015	$750 Million[10]
Total Interoperability Funding Need for Subscriber Equipment – 2015	$526 Million
Total Interoperability Funding Need for Maintenance & Operation – 2014/15	$61.5 Million
Total Projected Interoperability Funding Need	$1.33 Billion
Estimated Funding from Federal Government through 2015	$449.5 Million[11]
Funding Needed from the State of Texas through 2015	$888 Million

Aging infrastructure must be replaced. Some towers are more than 35 years old and have deteriorated, yet are still in use. The $1.334 billion in funding would provide a base level of operability and interoperability that meets P25 standards and system maintenance through 2015. Examples of equipment that are needed to fill this gap include: gateways, repeaters, microwave technology, radio consoles, mobile and portable radios, and mobile communication command vehicles.

Public Safety personnel also rely on Subscriber Radios for daily communications. Subscriber Radio procurements are primarily the responsibility of the local agency, but do comprise a large portion of annual communications funding.

The complex regional radio systems that comprise the "System of Systems" will require funding for ongoing maintenance and operations costs beyond 2015. In order for the public safety community to be able to sustain their radio communication systems – during both daily operations and emergencies – funding in the amount of $30.7 million annually for ongoing development, maintenance, and capital replacement of interoperable communications systems for emergency responders statewide will be necessary.

Yearly Maintenance & Operation Funding Need from the State of Texas – 2016 & on	$30.7 Million/yr

[9] Operation Texas Talks (http://www.txdps.state.tx.us/LawEnforcementSupport/communications/interop/documents/operTexasTalks.pdf)

[10] The $811.5 million requirement for a basic level of interoperable communications infrastructure needed statewide as well as funding needed for Maintenance and Operations was a finding of the Regional Interoperability Communications Plan - Round 2 (RICP-2) completed in the Spring of 2011.

[11] $159.287 million of the $449.5 million has been spent from FY 2007 through FY 2011 in Federal funding and local funding match, as administered and tracked by TxDPS.

6 Funding spent toward the vision

Since FY 2007, Texas jurisdictions have spent $159,287,794.85 in TxDPS-SAA distributed Federal funds, plus local match, for interoperable communications technology purchases, including infrastructure and equipment such as base stations/repeaters, mobile and portable radios, towers and antennas, and gateways and bridging equipment. This amount does not include expenditures on the development of SOPs, training and exercises conducted, or funding for strategy and governance development, which are also critical elements of emergency response communications.

Additional funds directly flow to local jurisdictions from the Federal Government or other entities. Local jurisdictions also budget local funds derived from local taxes, fees, bond elections, and certificates of obligation to support operable/interoperable communications. The figures captured in this report only reflect Federal funds that have flowed through the TxDPS-SAA office to local jurisdictions. There is no known centralized repository itemizing the described local communications operability/interoperability funding sources, amount, and expenditures.

The following table, Expenditures by COG on Interoperable Communications Equipment, is a summary of the TxDPS-SAA administered Federal grant funds expended by each COG on operable/interoperable communications equipment starting in FY 2007 through FY 2011. This table includes expenditures by COG per fiscal year (using the State's FY period – September 1st through August 31st), including the Public Safety Interoperable Communications (PSIC) matching funds by COG, and total amounts. TxDPS-SAA administered Federal grant funds to UASI jurisdictions are captured in the figures under the COG name where the UASI is located.

The TxDPS Statewide Interoperability Coordinator's (SWIC) Office and TxDPS-SAA partnered to further improve a methodology for collecting valid expenditures for communications equipment. The full methodology can be obtained by contacting the TxDPS SWIC Office at TXSWIC@dps.texas.gov, but key aspects of the methodology include collecting and sorting the expenditure data by:

- Communications Equipment Code – scoping the collected information by specific communications equipment codes as they are tracked by TxDPS-SAA.
- State of Texas Fiscal Year – scoping the data collection by Texas FY (September 1 through August 31). This timeframe aligns with the TxDPS-SAA funding cycles.

To view the raw data to extract and sort information by other aspects such as jurisdiction, grant name, etc., please email TXSWIC@dps.texas.gov.

Expenditures by COG on Interoperable Communications Equipment using DPS-Administered Federal Grant Funds for Texas State Fiscal Years FY 2007 through FY 2011

COG	FY2007 9/1/06 - 8/31/07	FY2008 9/1/07 - 8/31/08	FY2009 9/1/08 - 8/31/09	FY2010 9/1/09 - 8/31/10	FY2011** 9/1/10 - 8/31/11	Total***
AACOG	*	$ 214,400.89	$ 871,216.44	$ 1,006,479.01	$ 2,066,133.54	$ 4,158,229.88
ARKTEX	*	$ 52,546.03	$ 364,434.83	$ 963,913.23	$ 485,850.07	$ 1,866,744.16
BVCOG	$ 101,945.42	$ 279,349.95	$ 127,595.53	$ 388,223.91	$ 405,444.09	$ 1,302,558.90
CAPCOG	$ 206,390.26	$ 188,049.77	$ 711,562.27	$ 3,832,317.86	$ 1,540,422.21	$ 6,478,742.37
CTCOG	*	$ 514,798.41	$ 635,946.20	$ 1,327,276.62	$ 994,766.33	$ 3,472,787.56
CBCOG	$ 60,000.00	$ 342,385.74	$ 631,713.25	$ 1,099,314.36	$ 2,602,540.42	$ 4,735,953.77
CVCOG	*	$ 236,282.42	$ 36,392.51	$ 199,970.00	$ 1,564,047.10	$ 2,036,692.03
DETCOG	$ 52,659.39	$ 152,544.83	$ 209,981.22	$ 395,408.10	$ 827,651.57	$ 1,638,245.11
ETCOG	$ 93,619.61	$ 508,593.11	$ 359,945.73	$ 1,200,381.97	$ 822,054.56	$ 2,984,594.98
GCRPC	$ 22,849.65	$ 403,786.48	$ 726,972.12	$ 983,381.71	$ 1,205,266.40	$ 3,342,256.36
HOTCOG	$ 17,745.80	$ 5,292.61	$ 253,398.86	$ 1,633,781.82	$ 1,617,273.50	$ 3,527,492.59
HGAC	$ 388,166.45	$ 2,604,150.21	$ 4,999,519.46	$ 20,387,233.19	$ 21,737,218.26	$ 50,116,287.57
LRGVDC	$ 40,882.40	$ 407,224.47	$ 755,219.02	$ 1,056,994.92	$ 2,404,988.62	$ 4,665,309.43
MRGDC	*	$ 660,075.29	$ 326,673.50	$ 1,137,678.44	$ 220,686.53	$ 2,345,113.76
NORTEX	$ 94,253.47	$ 264,028.51	$ 515,332.22	$ 606,685.86	$ 443,232.03	$ 1,923,532.09
NCTCOG	$ 144,959.25	$ 862,804.29	$ 909,584.56	$ 5,964,191.37	$ 3,836,833.30	$ 11,718,372.77
PRPC	$ 75,220.00	$ 1,079,274.14	$ 2,060,382.78	$ 2,733,388.35	$ 689,052.31	$ 6,637,317.58
PBRPC	*	$ 286,696.95	$ 543,697.54	$ 886,484.63	$ 1,915,967.20	$ 3,632,846.32
RGCOG	$ 17,729.81	$ 167,159.28	$ 81,825.67	$ 7,007,310.19	$ 5,136,021.71	$ 12,410,046.66
SETRPC	*	$ 501,228.75	$ 238,411.38	$ 2,081,892.32	$ 182,069.90	$ 3,003,602.35
SPAG	$ 15,400.15	$ 255,239.38	$ 125,539.66	$ 951,568.32	$ 1,356,779.48	$ 2,704,526.99
STDC	$ 55,496.39	$ 125,018.84	$ 27,601.77	$ 1,968,170.85	$ 1,095,705.76	$ 3,271,993.61
Texoma	$ 22,225.88	$ 170,039.22	$ 126,250.50	$ 374,103.85	$ 346,688.52	$1,039,307.97
WCTCOG	$ 101,782.88	$ 251,803.42	$ 747,073.42	$ 1,156,826.55	$ 828,800.24	$ 3,086,286.51
STATE (including DPS)			$ 905,280.00	$ 3,636,061.73	$ 12,647,611.80	$ 17,188,953.53
Total	$ 1,511,326.81	$ 10,532,772.99	$ 17,291,550.44	$ 62,979,039.16	$ 66,973,105.45	$ 159,287,794.85

*** These COGs did not begin spending grant funding (on expenditure types included in this report) allocated in 2006 until after 8/31/07**

****FY2011 includes expenditures from September 1, 2010 until August 31, 2011**

NOTE: TxDPS-SAA administered Federal grant funds to UASI jurisdictions for interoperable communications are captured in the figures under the COG name where the UASI jurisdiction is located.

7 The Current Status of Voice Communications Interoperability in Texas (as of COG County Survey 6/8/12)

The Texas Statewide Communications Interoperability Maturity Model (TSCIMM), which appears below, is based on the SAFECOM Interoperability Continuum.[12] The TSCIMM outlines the evolution from the lowest level to the highest level of communications interoperability (Level One – least interoperable to Level Five – most interoperable). The following map of Texas highlights the current status of each county regarding their level of interoperability in the "Voice Technology" lane of the TSCIMM. The status is indicated by the individual colors associated with the five levels of interoperability in the TSCIMM.

Level One = The lowest level of interoperability, which is accomplished by physically exchanging radios to communicate with other agencies (swap radios)

Level Two = Minimal interoperability, which is accomplished with the use of gateway devices (electronically interconnecting two or more disparate radio systems through gateways)

Level Three = Mid-range interoperability through the use of shared channels

Level Four = Improved interoperability through the use of shared proprietary system(s)

Level Five = The optimal level of full interoperability through the use of P25 standards-based shared system(s) to communicate with other agencies

The color-coded map reflects a snapshot of each county's status of voice communications interoperability. This information was obtained directly from the 24 COGs through a survey submitted to DPS as of June 8, 2012. As the map indicates, for the most part, Texas has achieved slightly above Level Three (mid-range) wireless communications interoperability. In Appendix C, the three tables following the same map list the:

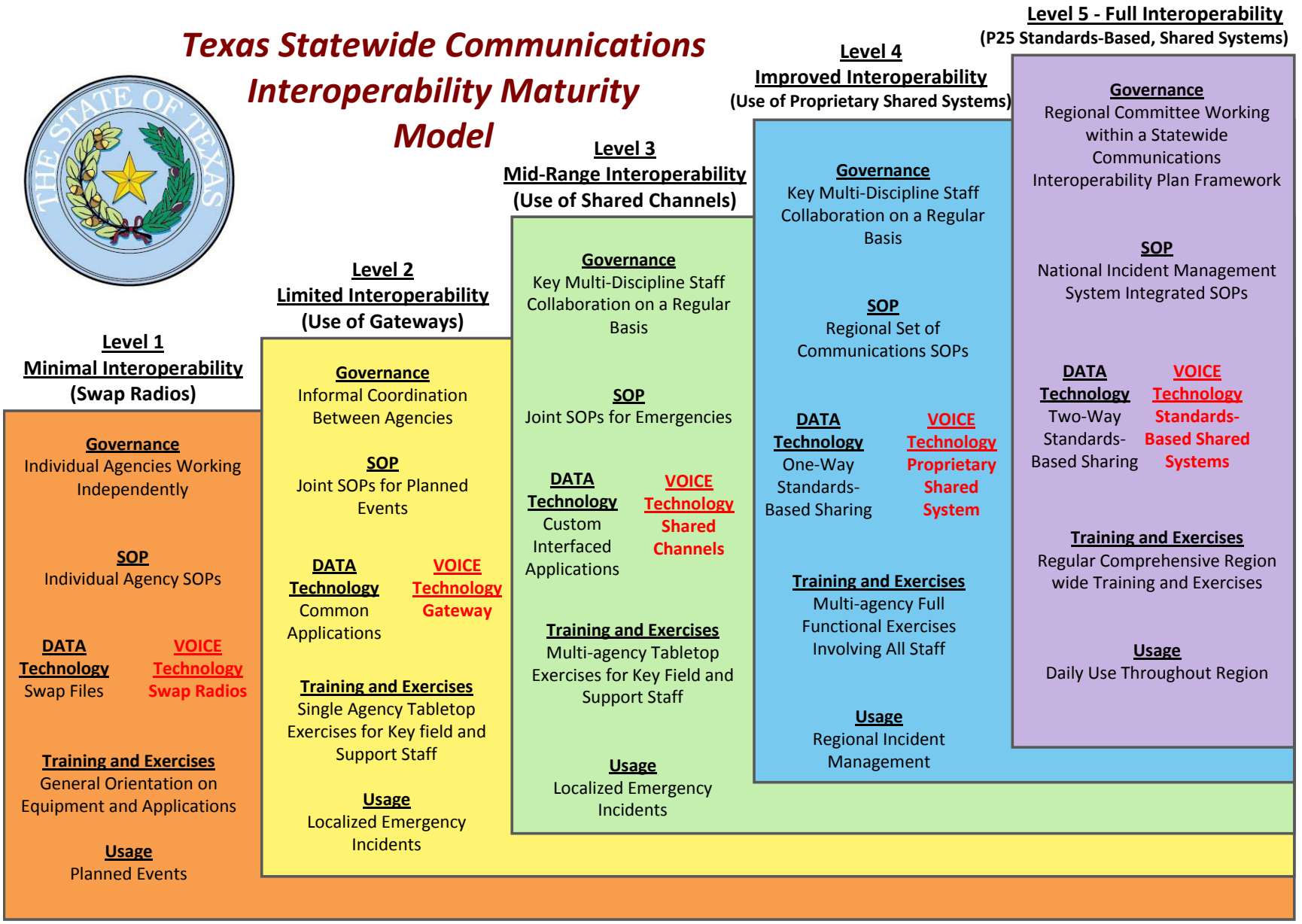
a) interoperability level of each county, sorted at the COG level;

b) interoperability level of each county, sorted by level; and

c) interoperability level of each county, sorted by county name alphabetically. The average level of interoperability statewide was determined to be 3.58 on the five-level scale, an increase from 3.33 in 2011.

[12] For additional information about the U.S. Department of Homeland Security's SAFECOM Interoperability Continuum developed by the SAFECOM program, see http://www.safecomprogram.gov/oecguidancedocuments/continuum/Default.aspx

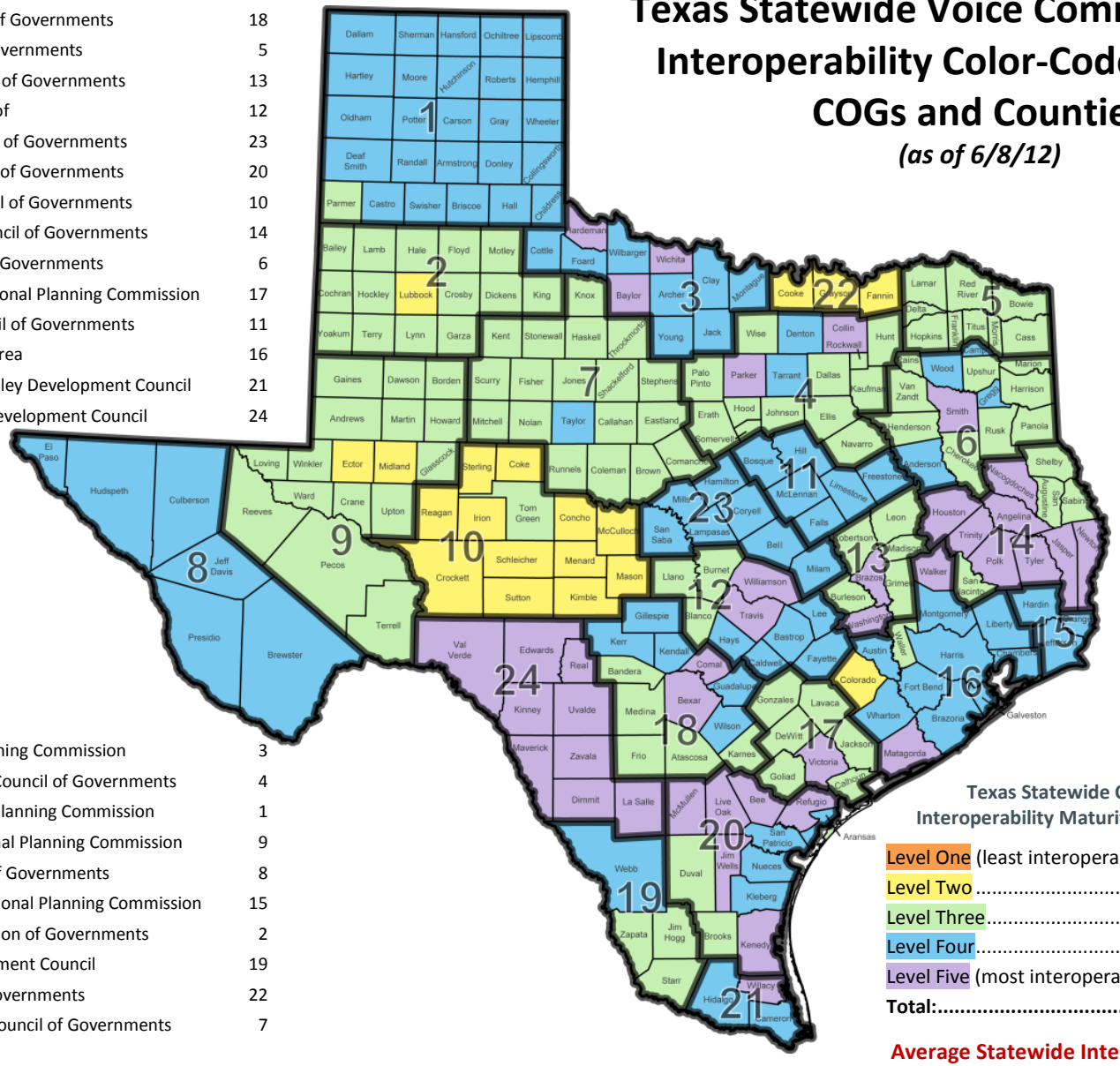
Texas Statewide Communications Interoperability Maturity Model



Texas Statewide Voice Communications Interoperability Color-Coded Map by COGs and Counties

(as of 6/8/12)

COG Region Name	*#*
Alamo Area Council of Governments	18
Ark-Tex Council of Governments	5
Brazos Valley Council of Governments	13
Capital Area Council of	12
Central Texas Council of Governments	23
Coastal Bend Council of Governments	20
Concho Valley Council of Governments	10
Deep East Texas Council of Governments	14
East Texas Council of Governments	6
Golden Crescent Regional Planning Commission	17
Heart of Texas Council of Governments	11
Houston-Galveston Area	16
Lower Rio Grande Valley Development Council	21
Middle Rio Grande Development Council	24
Nortex Regional Planning Commission	3
North Central Texas Council of Governments	4
Panhandle Regional Planning Commission	1
Permian Basin Regional Planning Commission	9
Rio Grande Council of Governments	8
South East Texas Regional Planning Commission	15
South Plains Association of Governments	2
South Texas Development Council	19
Texoma Council of Governments	22
West Central Texas Council of Governments	7



Texas Statewide Communications Interoperability Maturity Model Color Codes:

Level One (least interoperable)	0 Counties
Level Two	19 Counties
Level Three	108 Counties
Level Four	88 Counties
Level Five (most interoperable)	39 Counties
Total:	**254 Counties**

Average Statewide Interoperability Level: 3.58

8 Conclusion: When Texas will reach Level Five – Full Interoperability (P25 Standards-Based, Shared Systems Capability)

Achieving the vision of the Texas SCIP by the end of 2015 is entirely dependent upon receipt of needed funding for infrastructure: $37.4 million from the Federal Government through grants (which for the most part is being received on schedule) and $888 million from the Texas Legislature. It will mostly be up to local jurisdictions to provide funding for mobile and portable radios.

Texas' public safety community needs the Legislature to fund House Bill 442[13], which was established in 2011 without allocated funding. By approving $444 million annually until 2015, the public safety community will be able to complete construction of the "System of Systems", and by appropriating $30.7 million annually thereafter to 2011 H. B. 442, the public safety community will be able to sustain—during both daily operations and emergencies—their radio communication capabilities and fund ongoing development, maintenance, and capital replacement of interoperable communications systems for emergency responders statewide. This funding is critical to enabling emergency responders to talk within and across disciplines and jurisdictions on demand, in real time, and when authorized.

[13] House Bill 442 amends the Government Code to establish the emergency radio infrastructure account in the general revenue fund, consisting of criminal conviction fees and all interest attributable to money in the account.

Appendices:

A. Acronyms and Glossary

B. Expenditures on Communications Interoperability Equipment by: COG/State Fiscal Years (2007-2011) and Purchased Equipment Type

C. Voice Radio Communications Interoperability Levels across Texas

D. Associated Documents and Information

Appendix A:
Acronyms and Glossary

List of Acronyms

Acronym	Definition
COG	Council of Governments
D Block	Frequency range from 758 -763 MHz
DHS	Department of Homeland Security
EMS	Emergency Medical Services
EPC	Evolved Packet Core
FCC	Federal Communications Commission
LTE	Long Term Evolution
MHz	Megahertz
NECP	National Emergency Communications Plan
P25	Project 25 (formerly Association of Public-Safety Communications Officials - International Project 25)
PSIC	Public Safety Interoperable Communications
PSST	Public Safety Spectrum Trust
QoS	Quality of Service
RICP	Regional Interoperable Communications Plan
RAN	Radio Access Network
SCIP	Statewide Communications Interoperability Plan
SOPs	Standard Operating Procedures
TSCIMM	Texas Statewide Communications Interoperability Maturity Model
TxDPS	Texas Department of Public Safety
TxDPS-SAA	Texas Department of Public Safety State Administrative Agency (under TxDPS Chief of Staff; SAA Office administers grant programs)
TxICC	Texas Interoperable Communications Coalition
UHF	Ultra High Frequency
VHF	Very High Frequency

Glossary

Term	Definitions
3GPP LTE	The **3rd Generation Partnership Project** (3GPP) is the LTE standards body and is a collaboration between groups of telecommunications associations and standards bodies, known as the Organizational Partners. 3GPP standardization encompasses Radio, Core Network and Service architecture.
Backhaul	**Backhaul** (or Transport Network) connects all the LTE base stations (usually Tower Sites) to one another and to other components in the LTE system. Backhaul is often microwave or fiber-optic technology. Backhaul is also present in 3G and land mobile radio (LMR) systems.
Consoles	Desktop **Consoles** are self-contained radio dispatching units that control single or multiple base stations. Consoles may be remotely located in another part of the building, a branch office, or even in another city. Multiple desktop consoles can work in parallel to access and control a radio system. IP dispatch applications can be used to dynamically connect disparate networks, or provide over-IP control for a single network. Dispatchers, network administrators or other authorized personnel can set up connections in seconds to communicate with radio users.
Evolved NodeB (eNodeB)	**Evolved NodeB** (eNodeB or eNB) The single network element, which provides the user and control plan terminations, supports transmission and reception over the air interface, it comprises the e-UTRAN and connects to the EPC. Most simply it is an LTE RF site or base station.
Evolved Packet Core	The **Evolved Packet Core** (EPC) unifies voice and data into one subdomain and comprises all of the core network infrastructure to which the radio access network (RAN) elements connect.
Gateway	A **Gateway** is a network functional element which translates traffic between multiple, disparate networks. Gateways can connect over the air and over a wireline network.
Inter Subsystem Interface	The Project 25 Inter RF Subsystem Interface (**P25 ISSI**) is a non-proprietary interface that enables RF subsystems (RFSSs) built by different manufacturers to be connected together over a network interface. The wide area network connections using the ISSI provides an extended coverage area for subscriber units (SUs) that are roaming. The extended coverage area is important for public safety first responders that provide assistance in other jurisdictions during an emergency.

Glossary

Term	Definitions
Internet Protocol (IP)	**Internet Protocol** (IP) is the method by which data travels from one computer to another over the Internet. Each computer has an IP address that uniquely identifies it. IP-based communication systems can transform voice signals into digital information that then can be sent over data networks.
Microwave	**Microwave** systems can be used for any terrestrial based radio transmission including data, voice, and video. Both point-to-point and point-to-multipoint operations are permitted. For government agencies and municipalities, microwave systems can provide a more cost-effective solution with increased communications reliability and extended coverage over typical T1 and Fiber connections.
Mobile Communications Units	A **Mobile Communications Unit** (MCU) refers to any vehicular asset that can be deployed to provide or supplement communications capabilities in an incident area. Examples of the communications devices an MCU can house include subscriber and base station radios of various frequency bands, gateway devices, satellite phones, wireless computer networks, and video broadcasting/receiving equipment. MCUs provide the ability to communicate with every agency called upon to support an incident. This would include any federal agencies, State agencies, County Sheriffs' offices, municipal police departments, fire departments and protection districts/dispatch centers, highway departments, park departments, hospitals, ambulances, the American Red Cross, and amateur radio operators.
Mobile and Portable Radios	Mobile Radios installed in vehicles as well as Portable Radios that are hand-held units **can also be called subscriber units**. The cost associated with Subscriber Units includes the cost for the hardware, as well as all the software flash upgrades and programming costs.
Narrowbanding	FCC Docket 99-87: In December 2004, the FCC mandated that all Land Mobile Radio Systems operating below 512 MHz must upgrade to **Narrowband** equipment that more efficiently uses the frequency spectrum. Licensees are required to switch from equipment that uses 25 KHz of bandwidth (Wideband) for each channel, to equipment that uses 12.5 KHz (Narrowband) bandwidth per channel. The deadline for licensees to complete the transition is 12-31-2012.

Glossary

Term	Definitions
Project 25 Standards	Refers to the **Project 25** (P25) suite of standards for digital radio communications for use by Federal, State/province and local public safety agencies to enable them to communicate with other agencies and mutual aid response teams in emergencies. For additional information on P25 standards, please see http://www.project25.org
Radio Towers/Antennas	**Radio masts and towers** are structures designed to support antennas for telecommunications systems. **Antennas** provide system capability to transmit and receive radio waves.
Radio Access Network	The **Radio Access Network** (RAN) implements a radio access technology. Conceptually, it sits between the Mobile phone, and the core network. RAN equipment supports the administration and provisioning of the local users.
Repeaters	A **radio repeater** is a combination of a radio receiver and a radio transmitter that receives a weak or low-level signal and retransmits it at a higher level or higher power, so that the signal can cover longer distances without degradation. In dispatching, and emergency services communications, repeaters are used extensively to relay radio signals across a wider area. With most emergency dispatching systems, the repeater is synonymous with the base station, which performs both functions.

Appendix B:
Expenditures on Communications Interoperability Equipment by: COG / State Fiscal Year and Purchased Equipment Type

Appendix B-1:
Summary of Expenditures by COG on Interoperable Communications Equipment Using TxDPS-SAA Administered Federal Grant Funds for Texas State Fiscal Years 2007 through FY2011

Expenditures by COG on Interoperable Communications Equipment using DPS-Administered Federal Grant Funds for Texas State Fiscal Years FY 2007 through FY 2011

COG	FY2007 9/1/06 - 8/31/07	FY2008 9/1/07 - 8/31/08	FY2009 9/1/08 - 8/31/09	FY2010 9/1/09 - 8/31/10	FY2011** 9/1/10 - 8/31/11	Total***
AACOG	*	$ 214,400.89	$ 871,216.44	$ 1,006,479.01	$ 2,066,133.54	**$ 4,158,229.88**
ARKTEX	*	$ 52,546.03	$ 364,434.83	$ 963,913.23	$ 485,850.07	**$ 1,866,744.16**
BVCOG	$ 101,945.42	$ 279,349.95	$ 127,595.53	$ 388,223.91	$ 405,444.09	**$ 1,302,558.90**
CAPCOG	$ 206,390.26	$ 188,049.77	$ 711,562.27	$ 3,832,317.86	$ 1,540,422.21	**$ 6,478,742.37**
CTCOG	*	$ 514,798.41	$ 635,946.20	$ 1,327,276.62	$ 994,766.33	**$ 3,472,787.56**
CBCOG	$ 60,000.00	$ 342,385.74	$ 631,713.25	$ 1,099,314.36	$ 2,602,540.42	**$ 4,735,953.77**
CVCOG	*	$ 236,282.42	$ 36,392.51	$ 199,970.00	$ 1,564,047.10	**$ 2,036,692.03**
DETCOG	$ 52,659.39	$ 152,544.83	$ 209,981.22	$ 395,408.10	$ 827,651.57	**$ 1,638,245.11**
ETCOG	$ 93,619.61	$ 508,593.11	$ 359,945.73	$ 1,200,381.97	$ 822,054.56	**$ 2,984,594.98**
GCRPC	$ 22,849.65	$ 403,786.48	$ 726,972.12	$ 983,381.71	$ 1,205,266.40	**$ 3,342,256.36**
HOTCOG	$ 17,745.80	$ 5,292.61	$ 253,398.86	$ 1,633,781.82	$ 1,617,273.50	**$ 3,527,492.59**
HGAC	$ 388,166.45	$ 2,604,150.21	$ 4,999,519.46	$ 20,387,233.19	$ 21,737,218.26	**$ 50,116,287.57**
LRGVDC	$ 40,882.40	$ 407,224.47	$ 755,219.02	$ 1,056,994.92	$ 2,404,988.62	**$ 4,665,309.43**
MRGDC	*	$ 660,075.29	$ 326,673.50	$ 1,137,678.44	$ 220,686.53	**$ 2,345,113.76**
NORTEX	$ 94,253.47	$ 264,028.51	$ 515,332.22	$ 606,685.86	$ 443,232.03	**$ 1,923,532.09**
NCTCOG	$ 144,959.25	$ 862,804.29	$ 909,584.56	$ 5,964,191.37	$ 3,836,833.30	**$ 11,718,372.77**
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SETRPC	*	$ 501,228.75	$ 238,411.38	$ 2,081,892.32	$ 182,069.90	**$ 3,003,602.35**
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STATE (including DPS)			$ 905,280.00	$ 3,636,061.73	$ 12,647,611.80	**$ 17,188,953.53**
Total	**$ 1,511,326.81**	**$ 10,532,772.99**	**$ 17,291,550.44**	**$ 62,979,039.16**	**$ 66,973,105.45**	**$ 159,287,794.85**

*** These COGs did not begin spending grant funding (on expenditure types included in this report) allocated in 2006 until after 8/31/07**

****FY2011 includes expenditures from September 1, 2010 until August 31, 2011**

NOTE: TxDPS-SAA administered Federal grant funds to UASI jurisdictions for interoperable communications are captured in the figures under the COG name where the UASI jurisdiction is located.

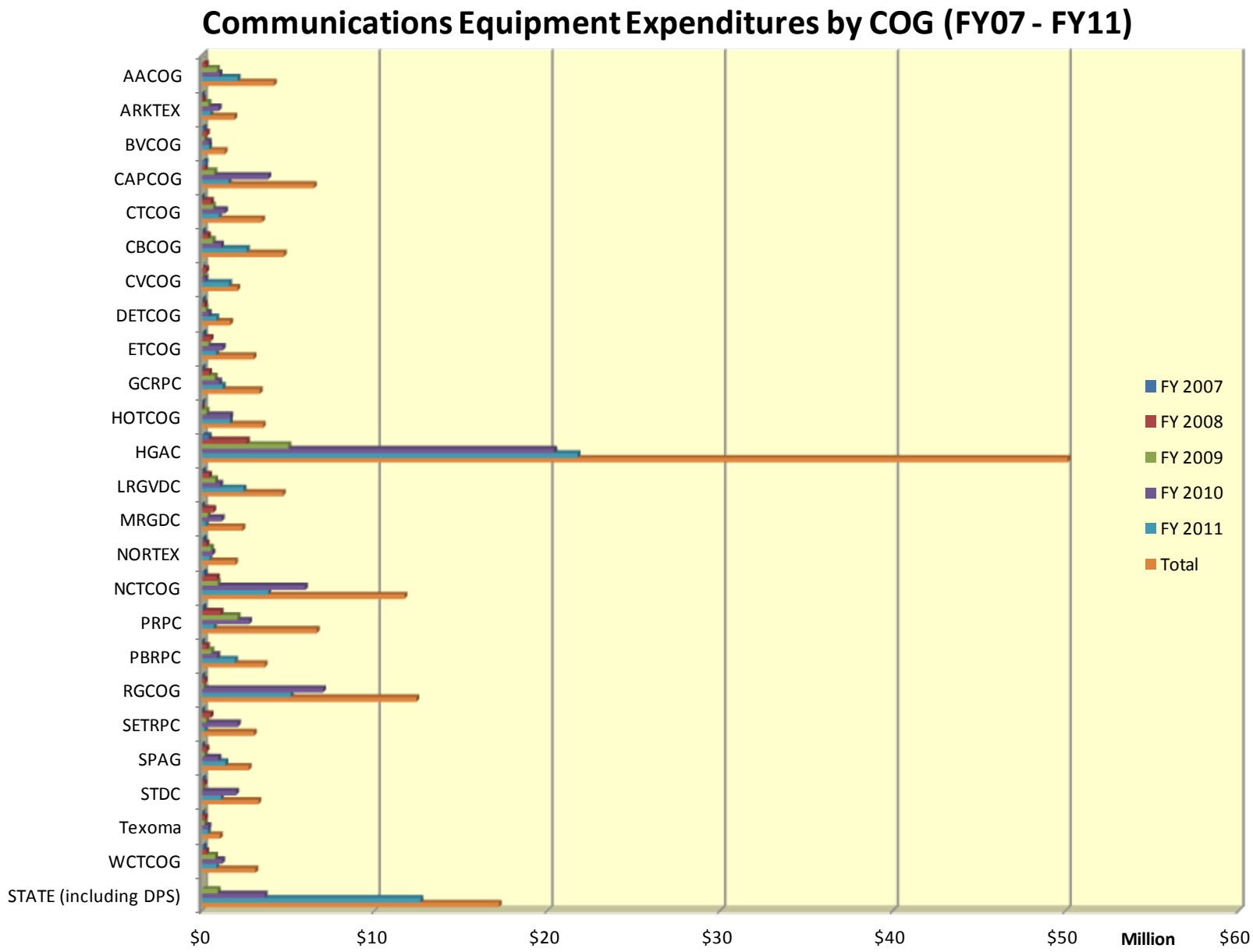
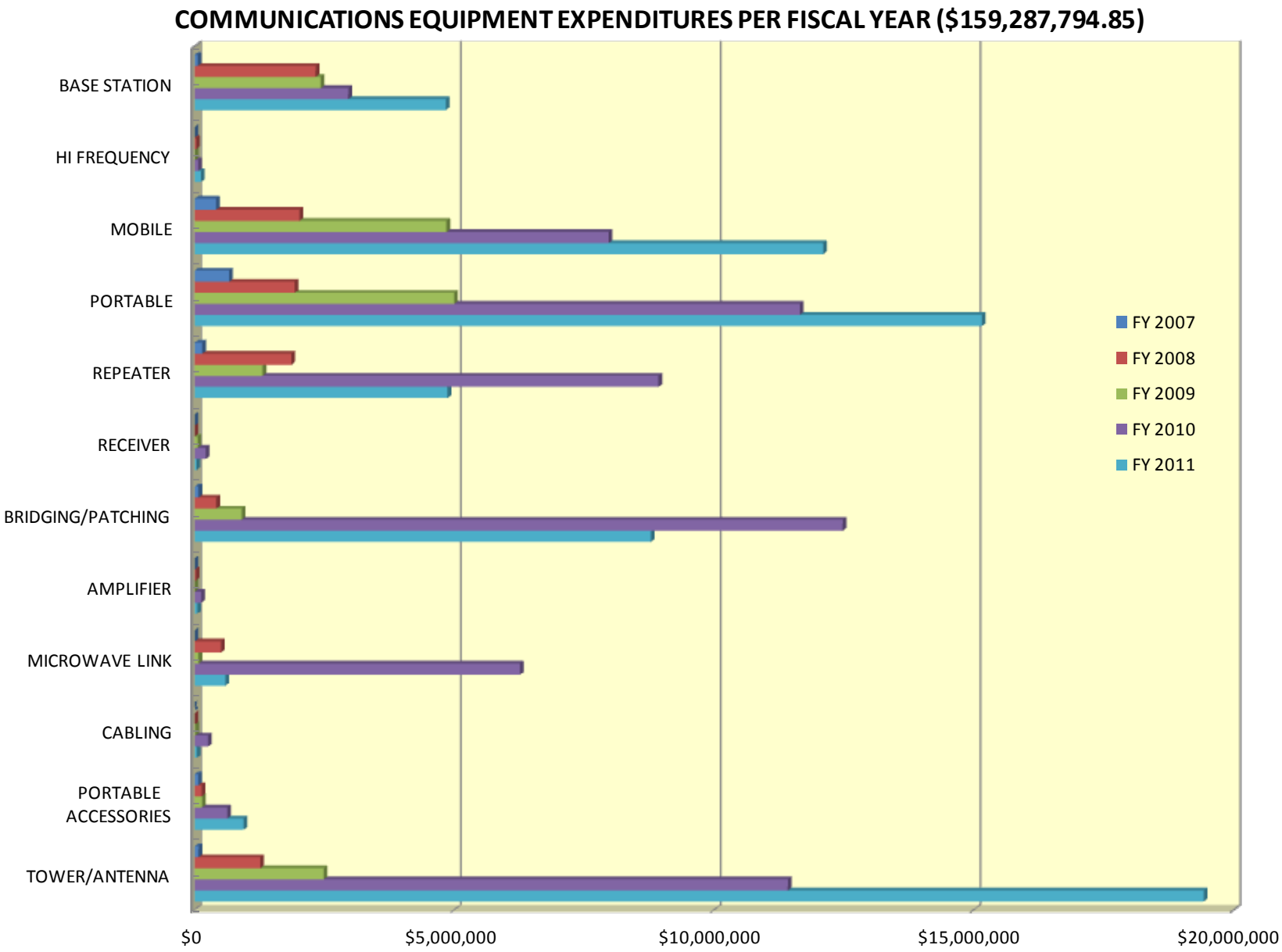

Communications Equipment Expenditures by COG (FY07 - FY11)
AACOG
ARKTEX
BVCOG
CAPCOG
CTCOG
CBCOG
CVCOG
DETCOG
ETCOG
GCRPC
HOTCOG
HGAC
LRGVDC
MRGDC
NORTEX
NCTCOG
PRPC
PBRPC
RGCOG
SETRPC
SPAG
STDC
Texoma
WCTCOG
STATE (including DPS)
FY 2007
FY 2008
FY 2009
FY 2010
FY 2011
Total
$0
$10
$20
$30
$40
$50
Million
$60

Table B-2:
Expenditures on Communications Interoperability Equipment by Equipment Type and Texas State Fiscal Years FY2007 – FY2011

Communications Equipment Expenditures by Equipment Type and Fiscal Year

Equipment Type	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	TOTALS
BASE STATION	$ 57,847.08	$ 2,331,710.38	$ 2,429,381.55	$ 2,959,630.11	$ 4,836,863.98	$ 12,615,433.10
HI FREQUENCY	$ -	$ 33,688.54	$ 10,618.60	$ 73,442.64	$ 122,130.73	$ 239,880.51
MOBILE	$ 413,694.45	$ 2,018,904.28	$ 4,848,877.14	$ 7,970,067.36	$ 12,101,883.11	$ 27,353,426.34
PORTABLE	$ 663,472.40	$ 1,925,820.34	$ 4,995,503.83	$ 11,650,938.80	$ 15,154,288.02	$ 34,390,023.39
REPEATER	$ 148,372.97	$ 1,864,012.46	$ 1,311,300.98	$ 8,929,133.10	$ 4,870,270.91	$ 17,123,090.42
RECEIVER	$ -	$ -	$ 62,174.50	$ 217,579.22	$ 38,757.78	$ 318,511.50
BRIDGING/PATCHING	$ 76,883.73	$ 419,105.99	$ 906,803.67	$ 12,474,785.07	$ 8,785,369.27	$ 22,662,947.73
AMPLIFIER	$ -	$ 23,047.35	$ 1,390.75	$ 130,621.94	$ 50,720.03	$ 205,780.07
MICROWAVE LINK	$ 700.00	$ 506,772.40	$ 77,111.64	$ 6,266,688.15	$ 594,695.83	$ 7,445,968.02
CABLING	$ -	$ 3,670.56	$ 17,328.84	$ 257,166.24	$ 46,192.51	$ 324,358.15
PORTABLE ACCESSORIES	$ 72,796.76	$ 138,957.79	$ 144,271.14	$ 629,709.63	$ 946,076.69	$ 1,931,812.01
TOWER/ANTENNA	$ 77,559.42	$ 1,267,082.90	$ 2,486,787.80	$ 11,419,276.90	$ 19,425,856.59	$ 34,676,563.61
TOTAL	**$ 1,511,326.81**	**$ 10,532,772.99**	**$ 17,291,550.44**	**$ 62,979,039.16**	**$ 66,973,105.45**	**$ 159,287,794.85**


COMMUNICATIONS EQUIPMENT EXPENDITURES PER FISCAL YEAR ($159,287,794.85)
BASE STATION
HI FREQUENCY
MOBILE
PORTABLE
REPEATER
RECEIVER
BRIDGING/PATCHING
AMPLIFIER
MICROWAVE LINK
CABLING
PORTABLE ACCESSORIES
TOWER/ANTENNA
FY 2007
FY 2008
FY 2009
FY 2010
FY 2011
$0
$5,000,000
$10,000,000
$15,000,000
$20,000,000

Appendix C:
Voice Radio Communications Interoperability Levels across Texas

7 The Current Status of Voice Communications Interoperability in Texas (as of COG County Survey 6/8/12)

The Texas Statewide Communications Interoperability Maturity Model (TSCIMM), which appears below, is based on the SAFECOM Interoperability Continuum.[14] The TSCIMM outlines the evolution from the lowest level to the highest level of communications interoperability (Level One – least interoperable to Level Five – most interoperable). The following map of Texas highlights the current status of each county regarding their level of interoperability in the "Voice Technology" lane of the TSCIMM. The status is indicated by the individual colors associated with the five levels of interoperability in the TSCIMM.

Level One = The lowest level of interoperability, which is accomplished by physically exchanging radios to communicate with other agencies (swap radios)

Level Two = Minimal interoperability, which is accomplished with the use of gateway devices (electronically interconnecting two or more disparate radio systems through gateways)

Level Three = Mid-range interoperability through the use of shared channels

Level Four = Improved interoperability through the use of shared proprietary system(s)

Level Five = The optimal level of full interoperability through the use of P25 standards-based shared system(s) to communicate with other agencies

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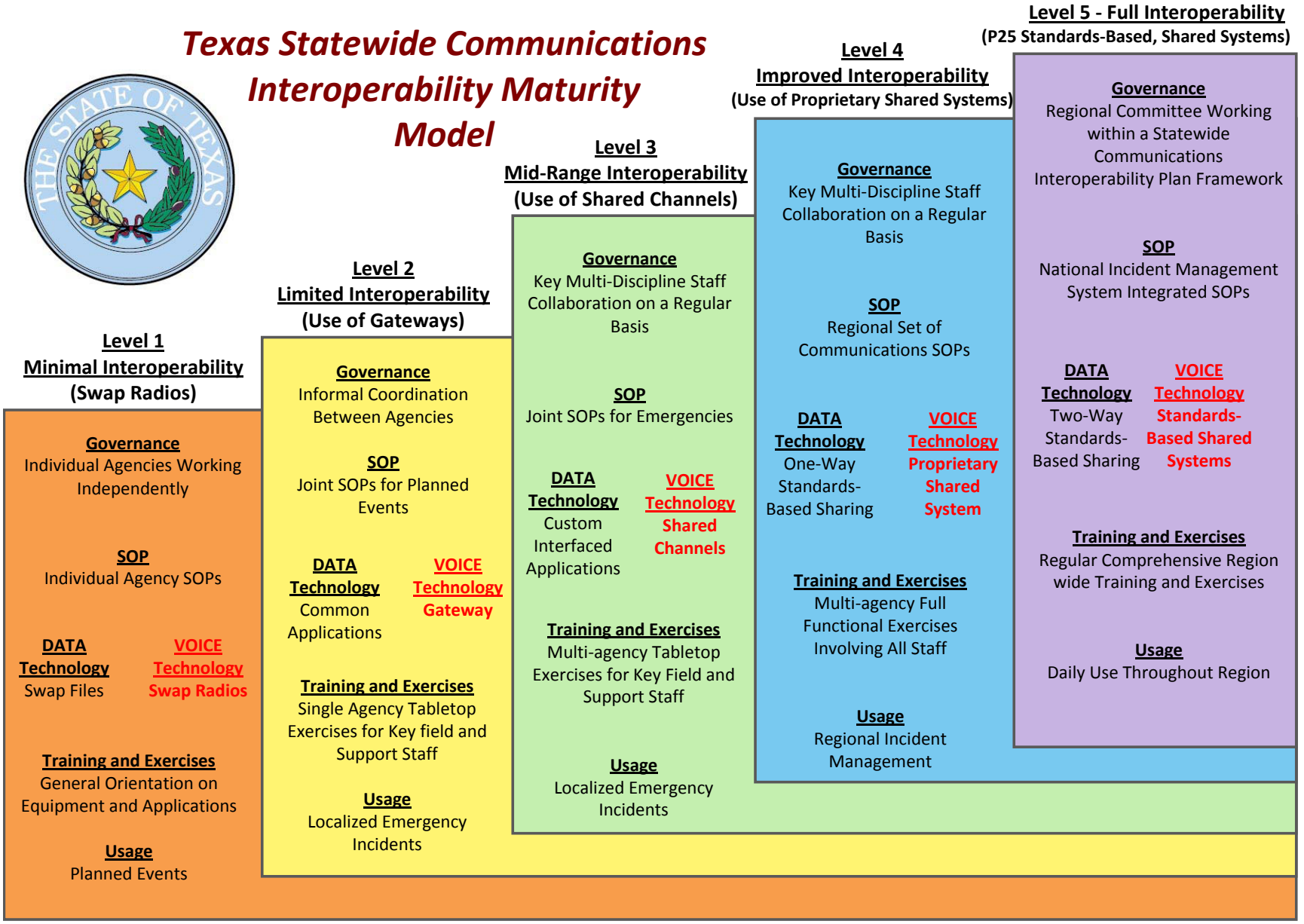
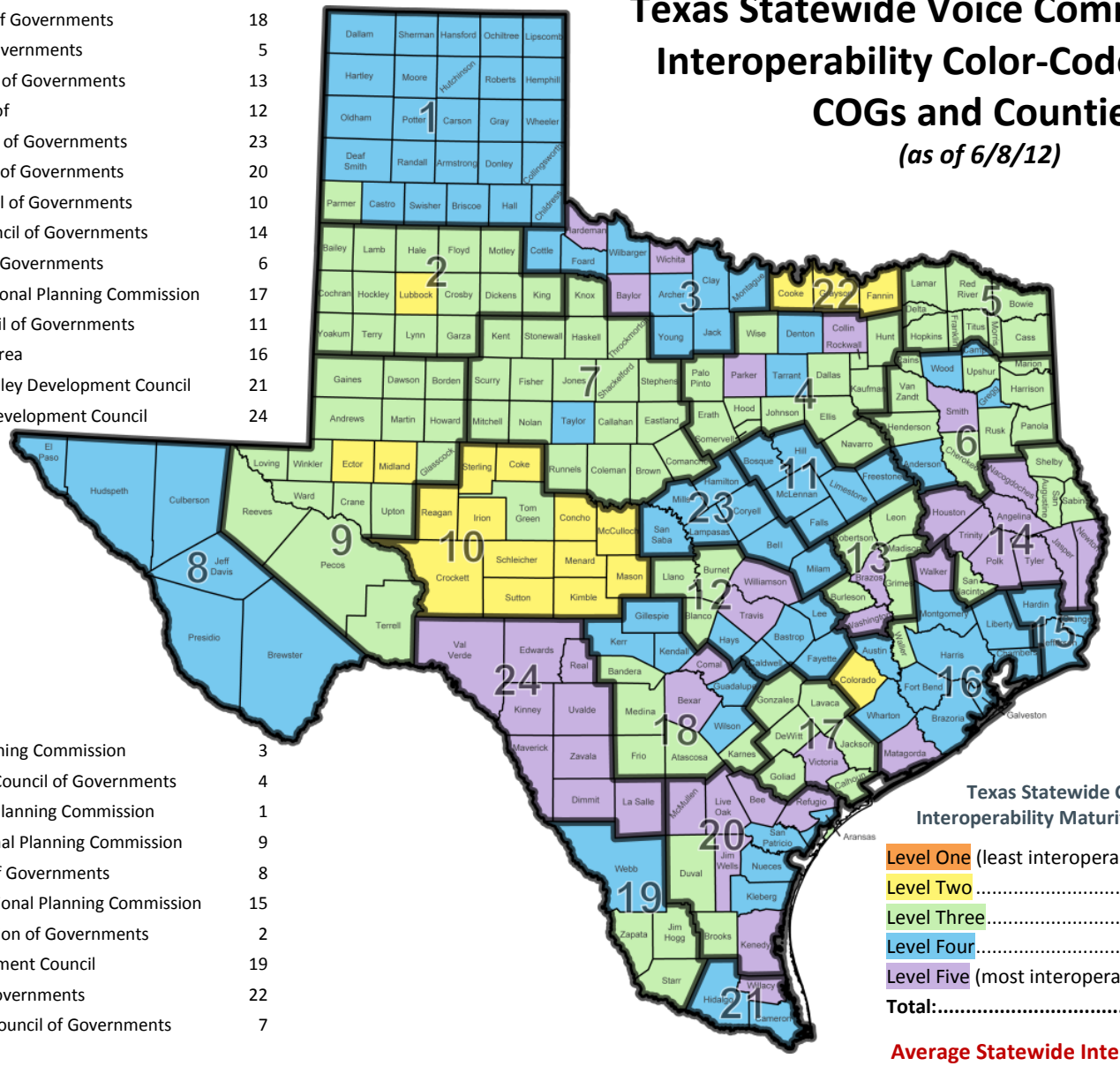
Texas Statewide Communications Interoperability Maturity Model



Texas Statewide Voice Communications Interoperability Color-Coded Map by COGs and Counties

(as of 6/8/12)

COG Region Name	*#*
Alamo Area Council of Governments	18
Ark-Tex Council of Governments	5
Brazos Valley Council of Governments	13
Capital Area Council of	12
Central Texas Council of Governments	23
Coastal Bend Council of Governments	20
Concho Valley Council of Governments	10
Deep East Texas Council of Governments	14
East Texas Council of Governments	6
Golden Crescent Regional Planning Commission	17
Heart of Texas Council of Governments	11
Houston-Galveston Area	16
Lower Rio Grande Valley Development Council	21
Middle Rio Grande Development Council	24
Nortex Regional Planning Commission	3
North Central Texas Council of Governments	4
Panhandle Regional Planning Commission	1
Permian Basin Regional Planning Commission	9
Rio Grande Council of Governments	8
South East Texas Regional Planning Commission	15
South Plains Association of Governments	2
South Texas Development Council	19
Texoma Council of Governments	22
West Central Texas Council of Governments	7



Texas Statewide Communications Interoperability Maturity Model Color Codes:

Level One (least interoperable)	0 Counties
Level Two	19 Counties
Level Three	108 Counties
Level Four	88 Counties
Level Five (most interoperable)	39 Counties
Total:	**254 Counties**

Average Statewide Interoperability Level: 3.58

Communications Interoperability Status by COG and County (As of 6/8/12)

Alamo Area COG		***Coastal Bend COG***		Panola	3
Bexar	5	Bee	5	Rains	3
Comal	5	Jim Wells	5	Rusk	3
Gillespie	4	Kenedy	5	Upshur	3
Guadalupe	4	Live Oak	5	Van Zandt	3
Kendall	4	McMullen	5	***Golden Crescent Regional Planning Commission***	
Kerr	4	Refugio	5	Victoria	5
Wilson	4	Aransas	4	Calhoun	3
Atascosa	3	Jim Nueces	4	Dewitt	3
Bandera	3	Kleberg	4	Goliad	3
Frio	3	San Patricio	4	Gonzales	3
Karnes	3	Brookes	3	Jackson	3
Medina	3	Duval	3	Lavaca	3
Ark-Tex COG		***Concho Valley COG***		***Heart of Texas COG***	
Bowie	3	Tom Green	3	Bosque	4
Cass	3	Coke	2	Falls	4
Delta	3	Concho	2	Freestone	4
Franklin	3	Crockett	2	Hill	4
Hopkins	3	Irion	2	Limestone	4
Lamar	3	Kimble	2	McLennan	4
Morris	3	Mason	2	***Houston - Galveston Area COG***	
Red River	3	McCulloch	2	Matagorda	5
Titus	3	Menard	2	Walker	5
Brazos Valley COG		Reagan	2	Austin	4
Brazos	5	Schleicher	2	Brazoria	4
Washington	5	Sterling	2	Chambers	4
Burleson	3	Sutton	2	Fort Bend	4
Grimes	3	***Deep East Texas COG***		Galveston	4
Leon	3	Angelina	5	Harris	4
Madison	3	Houston	5	Liberty	4
Robertson	3	Jasper	5	Montgomery	4
Capital Area COG		Nacagdoches	5	Wharton	4
Travis	5	Newton	5	Waller	3
Williamson	5	Polk	5	Colorado	2
Bastrop	4	Trinity	5	***Lower Rio Grande Valley Development Council***	
Caldwell	4	Tyler	5	Willacy	5
Fayette	4	Sabine	3	Cameron	4
Hays	4	San Augustine	3	Hidalgo	4
Lee	4	San Jacinto	3	***Middle Rio Grande Development Council***	
Blanco	3	Shelby	3	Dimmit	5
Burnet	3	***East Texas COG***		Edwards	5
Llano	3	Smith	5	Kinney	5
Central Texas COG		Anderson	4	LaSalle	5
Bell	4	Camp	4	Maverick	5
Coryell	4	Gregg	4	Real	5
Hamilton	4	Wood	4	Uvalde	5
Lampasas	4	Cherokee	3	Valverde	5
Milam	4	Harrison	3	Zavala	5
Mills	4	Henderson	3		
San Saba	4	Marion	3		

Communications Interoperability Status by COG and County (As of 6/8/12)

Nortex Regional Planning Commission		Hutchinson	4	Crosby	3
Baylor	5	Lipscomb	4	King	3
Hardeman	5	Moore	4	Terry	3
Wichita	5	Ochiltree	4	Dickens	3
Archer	4	Oldham	4	Floyd	3
Clay	4	Potter	4	Garza	3
Cottle	4	Randall	4	Lynn	3
Foard	4	Roberts	4	Motley	3
Jack	4	Sherman	4	Yoakum	3
Montague	4	Swisher	4	Hale	3
Wilbarger	4	Wheeler	4	Hockley	3
Young	4	Parmer	3	Lamb	3
North Central Texas COG		***Permian Basin Regional Planning Commission***		Lubbock	2
Collin	5	Andrews	3	***South Texas Development Council***	
Parker	5	Borden	3	Webb	4
Denton	4	Crane	3	Starr	3
Tarrant	4	Dawson	3	Zapata	3
Dallas	3	Gaines	3	Jim Hogg	3
Ellis	3	Glasscock	3	***Texoma Council of Governments***	
Erath	3	Howard	3	Cooke	2
Hood	3	Loving	3	Fannin	2
Hunt	3	Martin	3	Grayson	2
Johnson	3	Pecos	3	***West Central Texas COG***	
Kaufman	3	Reeves	3	Taylor	4
Navarro	3	Terrell	3	Brown	3
Palo Pinto	3	Upton	3	Callahan	3
Rockwall	3	Ward	3	Coleman	3
Somervell	3	Winkler	3	Comanche	3
Wise	3	Ector	2	Eastland	3
Panhandle Regional Planning Commission		Midland	2	Fisher	3
Armstrong	4	***Rio Grande Council of Governments***		Haskell	3
Briscoe	4	Brewster	4	Jones	3
Carson	4	Culberson	4	Kent	3
Castro	4	El Paso	4	Knox	3
Childress	4	Hudspeth	4	Mitchell	3
Collingsworth	4	Jeff Davis	4	Nolan	3
Dallam	4	Presidio	4	Runnels	3
Deaf Smith	4	***South East Texas Regional Planning Commission***		Scurry	3
Donley	4	Hardin	4	Shackelford	3
Gray	4	Jefferson	4	Stephens	3
Hall	4	Orange	4	Stonewall	3
Hansford	4	***South Plains Association of Governments***		Throckmorton	3
Hartley	4	Bailey	3		
Hemphill	4	Cochran	3		

Communications Interoperability Status by Level and County (As of 6/8/12)

County	COG	Level
Angelina	Deep East Texas Council of Governments	5
Baylor	Nortex Regional Planning Commission	5
Bee	Coastal Bend Council of Governments	5
Bexar	Alamo Area Council of Governments	5
Brazos	Brazos Valley Council of Governments	5
Collin	North Central Texas Council of Governments	5
Comal	Alamo Area Council of Governments	5
Dimmit	Middle Rio Grande Development Council	5
Edwards	Middle Rio Grande Development Council	5
Hardeman	Nortex Regional Planning Commission	5
Houston	Deep East Texas Council of Governments	5
Jasper	Deep East Texas Council of Governments	5
Johnson	North Central Texas Council of Governments	5
Kent	West Central Texas Council of Governments	5
Kleberg	Coastal Bend Council of Governments	5
Lavaca	Golden Crescent Regional Planning Commission	5
Llano	Capital Area Council of Governments	5
Maverick	Middle Rio Grande Development Council	5
McCulloch	Concho Valley Council of Governments	5
Medina	Alamo Area Council of Governments	5
Navarro	North Central Texas Council of Governments	5
Nolan	West Central Texas Council of Governments	5
Parker	North Central Texas Council of Governments	5
Polk	Deep East Texas Council of Governments	5
Real	Middle Rio Grande Development Council	5
Refugio	Coastal Bend Council of Governments	5
Smith	East Texas Council of Governments	5
Travis	Capital Area Council of Governments	5
Trinity	Deep East Texas Council of Governments	5
Tyler	Deep East Texas Council of Governments	5
Uvalde	Middle Rio Grande Development Council	5
Val Verde	Middle Rio Grande Development Council	5
Victoria	Golden Crescent Regional Planning Commission	5
Walker	Houston-Galveston Area Council	5
Washington	Brazos Valley Council of Governments	5
Wichita	Nortex Regional Planning Commission	5
Willacy	Lower Rio Grande Valley Development Council	5
Williamson	Capital Area Council of Governments	5

County	COG	Level
Zavala	Middle Rio Grande Development Council	5
Anderson	East Texas Council of Governments	4
Aransas	Coastal Bend Council of Governments	4
Archer	Nortex Regional Planning Commission	4
Armstrong	Panhandle Regional Planning Commission	4
Austin	Houston-Galveston Area Council	4
Bastrop	Capital Area Council of Governments	4
Bell	Central Texas Council of Governments	4
Bosque	Heart of Texas Council of Governments	4
Brazoria	Houston-Galveston Area Council	4
Brewster	Rio Grande Council of Governments	4
Briscoe	Panhandle Regional Planning Commission	4
Caldwell	Capital Area Council of Governments	4
Cameron	Lower Rio Grande Valley Development Council	4
Camp	East Texas Council of Governments	4
Carson	Panhandle Regional Planning Commission	4
Castro	Panhandle Regional Planning Commission	4
Chambers	Houston-Galveston Area Council	4
Childress	Panhandle Regional Planning Commission	4
Clay	Nortex Regional Planning Commission	4
Collingsworth	Panhandle Regional Planning Commission	4
Coryell	Central Texas Council of Governments	4
Cottle	Nortex Regional Planning Commission	4
Culberson	Rio Grande Council of Governments	4
Dallam	Panhandle Regional Planning Commission	4
Deaf Smith	Panhandle Regional Planning Commission	4
Denton	North Central Texas Council of Governments	4
Donley	Panhandle Regional Planning Commission	4
El Paso	Rio Grande Council of Governments	4
Falls	Heart of Texas Council of Governments	4
Fayette	Capital Area Council of Governments	4
Foard	Nortex Regional Planning Commission	4
Fort Bend	Houston-Galveston Area Council	4
Freestone	Heart of Texas Council of Governments	4
Galveston	Houston-Galveston Area Council	4
Gillespie	Alamo Area Council of Governments	4
Gray	Panhandle Regional Planning Commission	4
Gregg	East Texas Council of Governments	4
Guadalupe	Alamo Area Council of Governments	4
Hall	Panhandle Regional Planning Commission	4

County	COG	Level
Hamilton	Central Texas Council of Governments	4
Hansford	Panhandle Regional Planning Commission	4
Hardin	South East Texas Regional Planning Commission	4
Harris	Houston-Galveston Area Council	4
Hartley	Panhandle Regional Planning Commission	4
Hays	Capital Area Council of Governments	4
Hemphill	Panhandle Regional Planning Commission	4
Hidalgo	Lower Rio Grande Valley Development Council	4
Hill	Heart of Texas Council of Governments	4
Hudspeth	Rio Grande Council of Governments	4
Hutchinson	Panhandle Regional Planning Commission	4
Jack	Nortex Regional Planning Commission	4
Jeff Davis	Rio Grande Council of Governments	4
Jefferson	South East Texas Regional Planning Commission	4
Jim Wells	Coastal Bend Council of Governments	4
Kenedy	Coastal Bend Council of Governments	4
Kimble	Concho Valley Council of Governments	4
Knox	West Central Texas Council of Governments	4
LaSalle	Middle Rio Grande Development Council	4
Leon	Brazos Valley Council of Governments	4
Limestone	Heart of Texas Council of Governments	4
Lipscomb	Panhandle Regional Planning Commission	4
Live Oak	Coastal Bend Council of Governments	4
McMullen	Coastal Bend Council of Governments	4
Mills	Central Texas Council of Governments	4
Mitchell	West Central Texas Council of Governments	4
Montgomery	Houston-Galveston Area Council	4
Moore	Panhandle Regional Planning Commission	4
Morris	Ark-Tex Council of Governments	4
Ochiltree	Panhandle Regional Planning Commission	4
Oldham	Panhandle Regional Planning Commission	4
Orange	South East Texas Regional Planning Commission	4
Potter	Panhandle Regional Planning Commission	4
Presidio	Rio Grande Council of Governments	4
Roberts	Panhandle Regional Planning Commission	4
San Patricio	Coastal Bend Council of Governments	4
San Saba	Central Texas Council of Governments	4
Sherman	Panhandle Regional Planning Commission	4
Swisher	Panhandle Regional Planning Commission	4
Tarrant	North Central Texas Council of Governments	4

County	COG	Level
Taylor	West Central Texas Council of Governments	4
Webb	South Texas Development Council	4
Wharton	Houston-Galveston Area Council	4
Wheeler	Panhandle Regional Planning Commission	4
Wilbarger	Nortex Regional Planning Commission	4
Wilson	Alamo Area Council of Governments	4
Wood	East Texas Council of Governments	4
Young	Nortex Regional Planning Commission	4
Andrews	Permian Basin Regional Planning Commission	3
Atascosa	Alamo Area Council of Governments	3
Bailey	South Plains Association of Governments	3
Bandera	Alamo Area Council of Governments	3
Blanco	Capital Area Council of Governments	3
Borden	Permian Basin Regional Planning Commission	3
Bowie	Ark-Tex Council of Governments	3
Brooks	Coastal Bend Council of Governments	3
Brown	West Central Texas Council of Governments	3
Burleson	Brazos Valley Council of Governments	3
Burnet	Capital Area Council of Governments	3
Calhoun	Golden Crescent Regional Planning Commission	3
Callahan	West Central Texas Council of Governments	3
Cass	Ark-Tex Council of Governments	3
Cherokee	East Texas Council of Governments	3
Cochran	South Plains Association of Governments	3
Coleman	West Central Texas Council of Governments	3
Comanche	West Central Texas Council of Governments	3
Crane	Permian Basin Regional Planning Commission	3
Crosby	South Plains Association of Governments	3
Dallas	North Central Texas Council of Governments	3
Dawson	Permian Basin Regional Planning Commission	3
Delta	Ark-Tex Council of Governments	3
Dewitt	Golden Crescent Regional Planning Commission	3
Dickens	South Plains Association of Governments	3
Duval	Coastal Bend Council of Governments	3
Eastland	West Central Texas Council of Governments	3
Ellis	North Central Texas Council of Governments	3
Erath	North Central Texas Council of Governments	3
Fisher	West Central Texas Council of Governments	3
Floyd	South Plains Association of Governments	3
Franklin	Ark-Tex Council of Governments	3

County	COG	Level
Frio	Alamo Area Council of Governments	3
Gaines	Permian Basin Regional Planning Commission	3
Garza	South Plains Association of Governments	3
Glasscock	Permian Basin Regional Planning Commission	3
Goliad	Golden Crescent Regional Planning Commission	3
Gonzales	Golden Crescent Regional Planning Commission	3
Grimes	Brazos Valley Council of Governments	3
Hale	South Plains Association of Governments	3
Harrison	East Texas Council of Governments	3
Haskell	West Central Texas Council of Governments	3
Henderson	East Texas Council of Governments	3
Hockley	South Plains Association of Governments	3
Hood	North Central Texas Council of Governments	3
Hopkins	Ark-Tex Council of Governments	3
Howard	Permian Basin Regional Planning Commission	3
Hunt	North Central Texas Council of Governments	3
Jackson	Golden Crescent Regional Planning Commission	3
Jim Hogg	South Texas Development Council	3
Jones	West Central Texas Council of Governments	3
Karnes	Alamo Area Council of Governments	3
Kaufman	North Central Texas Council of Governments	3
Kendall	Alamo Area Council of Governments	3
Kerr	Alamo Area Council of Governments	3
Kinney	Middle Rio Grande Development Council	3
Lamar	Ark-Tex Council of Governments	3
Lamb	South Plains Association of Governments	3
Lampasas	Central Texas Council of Governments	3
Lee	Capital Area Council of Governments	3
Liberty	Houston-Galveston Area Council	3
Loving	Permian Basin Regional Planning Commission	3
Lubbock	South Plains Association of Governments	3
Madison	Brazos Valley Council of Governments	3
Marion	East Texas Council of Governments	3
Martin	Permian Basin Regional Planning Commission	3
Mason	Concho Valley Council of Governments	3
Menard	Concho Valley Council of Governments	3
Montague	Nortex Regional Planning Commission	3
Motley	South Plains Association of Governments	3
Nacogdoches	Deep East Texas Council of Governments	3
Newton	Deep East Texas Council of Governments	3

County	COG	Level
Nueces	Coastal Bend Council of Governments	3
Palo Pinto	North Central Texas Council of Governments	3
Panola	East Texas Council of Governments	3
Parmer	Panhandle Regional Planning Commission	3
Pecos	Permian Basin Regional Planning Commission	3
Rains	East Texas Council of Governments	3
Randall	Panhandle Regional Planning Commission	3
Red River	Ark-Tex Council of Governments	3
Reeves	Permian Basin Regional Planning Commission	3
Robertson	Brazos Valley Council of Governments	3
Rockwall	North Central Texas Council of Governments	3
Runnels	West Central Texas Council of Governments	3
Rusk	East Texas Council of Governments	3
Sabine	Deep East Texas Council of Governments	3
San Augustine	Deep East Texas Council of Governments	3
San Jacinto	Deep East Texas Council of Governments	3
Scurry	West Central Texas Council of Governments	3
Shackelford	West Central Texas Council of Governments	3
Shelby	Deep East Texas Council of Governments	3
Somervell	North Central Texas Council of Governments	3
Starr	South Texas Development Council	3
Stephens	West Central Texas Council of Governments	3
Stonewall	West Central Texas Council of Governments	3
Terrell	Permian Basin Regional Planning Commission	3
Terry	South Plains Association of Governments	3
Throckmorton	West Central Texas Council of Governments	3
Titus	Ark-Tex Council of Governments	3
Tom Green	Concho Valley Council of Governments	3
Upshur	East Texas Council of Governments	3
Upton	Permian Basin Regional Planning Commission	3
Van Zandt	East Texas Council of Governments	3
Waller	Houston-Galveston Area Council	3
Ward	Permian Basin Regional Planning Commission	3
Winkler	Permian Basin Regional Planning Commission	3
Wise	North Central Texas Council of Governments	3
Yoakum	South Plains Association of Governments	3
Zapata	South Texas Development Council	3
Coke	Concho Valley Council of Governments	2
Colorado	Houston-Galveston Area Council	2
Concho	Concho Valley Council of Governments	2

County	COG	Level
Cooke	Texoma Council of Governments	2
Crockett	Concho Valley Council of Governments	2
Ector	Permian Basin Regional Planning Commission	2
Fannin	Texoma Council of Governments	2
Grayson	Texoma Council of Governments	2
Irion	Concho Valley Council of Governments	2
King	South Plains Association of Governments	2
Lynn	South Plains Association of Governments	2
Matagorda	Houston-Galveston Area Council	2
McLennan	Heart of Texas Council of Governments	2
Midland	Permian Basin Regional Planning Commission	2
Milam	Central Texas Council of Governments	2
Reagan	Concho Valley Council of Governments	2
Schleicher	Concho Valley Council of Governments	2
Sterling	Concho Valley Council of Governments	2
Sutton	Concho Valley Council of Governments	2

Appendix D:
Associated Documents and Information

Associated Documents and Information

Additional supporting information such as the resources below can be found on the Texas Department of Public Safety website: http://www.txdps.state.tx.us/LawEnforcementSupport/communications/interop/

- "When They Can't Talk" brochure – from the National Association of Counties
- "Operation Texas Talks" brochure
- Texas Statewide Communications Interoperability Plan (SCIP)
- State of Texas Expedited Petition for 700 MHz Broadband Waiver, State of Texas Petition for Expedition, FCC 700 MHz Broadband Waiver Grant to State of Texas, and State of Texas Broadband Interoperability Showing to the FCC
- Texas Statewide Interoperability Channel Plan
- SCIP Implementation Reports to U.S. Dept. of Homeland Security, Office of Emergency Communications for 2008, 2009, 2010, and 2011
- National Emergency Communications Plan, 2008